

Adapted Primary Literature for Teaching

Writing About Testing Worries Boosts Exam Performance in the Classroom

Original research report: Ramirez, G., and Beilock, S. L. 2011. Writing about testing worries boosts exam performance in the classroom. *Science*. 331:211-213.

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Abstract

The authors tested an idea that they thought might reduce the negative effect of student test anxiety on performance on high-stakes tests. They performed laboratory tests with college students and classroom tests on 9th grade Biology students. Results showed that test-anxious students performed better on the exams if they spent 10 minutes just prior to the exam writing a little personal essay about their feelings about the test they were about to take.

Introduction

Many students “choke” on important examinations. That is, their fears and anxieties cause them to score lower than they should.

The researchers thought that if test-anxious students could express their feelings before a test, it might improve their performance. The authors argue that worries compete for the working memory needed to perform well. (Working memory is the information you have actively in mind as you think. For example, people sometimes have trouble remembering a phone number after looking it up long enough to dial it. It is similar to the tip-of-the-tongue problem where you can't recall something you know you know.)

Studies done by others in other contexts had shown that writing about traumatic or emotional experiences can decrease worry and

anxiety. The authors hypothesized that this might apply to test anxiety on high-stakes tests in school. That is, if an anxious student can vent worries before the test, they are less likely to disrupt working memory during the test.

The authors recognized that writing about worries might make matters worse by calling attention to them. But they hypothesized that once vented, worries might be less able to undermine test performance.

Methods

Laboratory Experiments of College Students

In this study group, college students took a math test twice, once under a low-stress situation and another under high stress. The test was on modular arithmetic, which is not familiar to most college students. Apparently these test subjects were not given any instruction before the test.

The high-stakes condition involved telling the students there would be a money reward for good performance. Also, they were told there would be a public evaluation in which fellow students observed a videotape of how each student performed.

Just before the test, the high-stakes group was given 10 minutes to write private personal essays about their feelings. For simplicity, we will refer to this as “worry writing.” The other half of students served as controls. They just sat quietly for 10 minutes. Then, they all took the high-stakes test.

Studies of 9th Grade Biology Students

Ninth grade Biology students participated in related experiments. The effect of worry writing was evaluated on the final exam performance. Six weeks before testing, the students completed a survey that indicated how likely they were to have test anxiety.

As in the Laboratory Experiments, half of the group served as a control and the other half wrote private personal essays about their

feelings and worries on the test they were about to take.

Results

Laboratory Experiments of College Students

Both groups of students performed about the same on the first, low-stakes test. However, in the second, high-stakes, test, the control group showed signs of choking, performing 12% lower on average on the high-stakes test, whereas the pre-test writing group showed an average 5% gain from the first test to the second (Fig. 1).

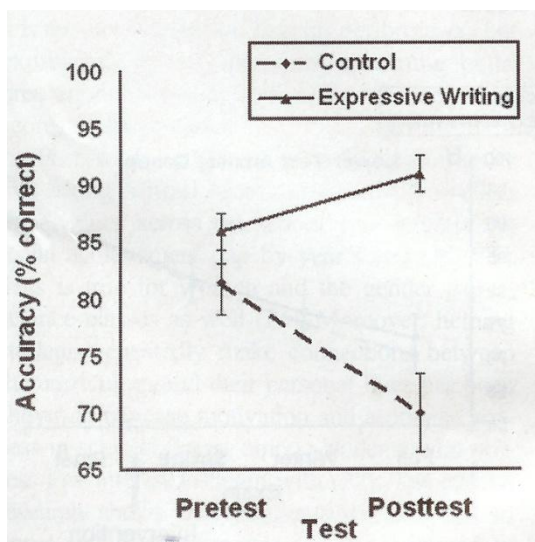


Fig. 1. Average test scores of the college students on the first, low-stakes test ("Pretest") and the second, high-stakes test ("Posttest"). The vertical bars around each average data point are "standard errors of the mean," which is a measure of the variation within each group.

Next, the authors wanted to test whether it was writing as such that was beneficial or if that the benefit came from writing about anxiety and worries. So in this test, other college students were tested in a similar way. However, here there were three groups: a control group, a group that wrote about worries just before the high-stakes test, and a third group that wrote about some unrelated ordinary event in their life.

The results (Fig. 2) indicated that the benefit was due to writing about specific test worries, not just writing in general.

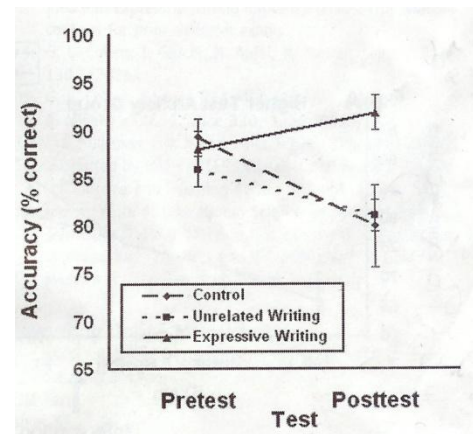


Fig. 2. Differences in test scores in which a third group of students was told to write about something unrelated to the test.

Studies of 9th Grade Biology Students

Data analysis indicated a correlation between test anxiety and final exam scores in the control group (Fig. 3A). That is, there was an overall trend for scores to be lower in students whom the prior survey indicated were more test anxious.

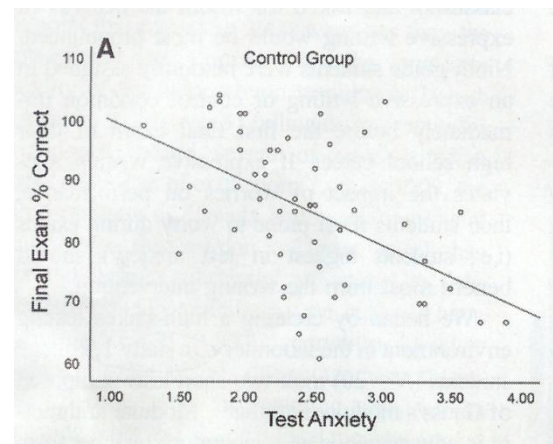


Fig. 3A. In the control group, each student's anxiety score was plotted as a function of his or her final exam grade. This produces what is called a "scatter plot." The line is derived from a calculation of the line which best fits and represents the entire data set. Thus, the

best-fit line shows a decline in test scores with high test anxiety.

This relationship was not seen in the group of 9th graders that wrote the personal worry essay just prior to testing (Fig. 3B).

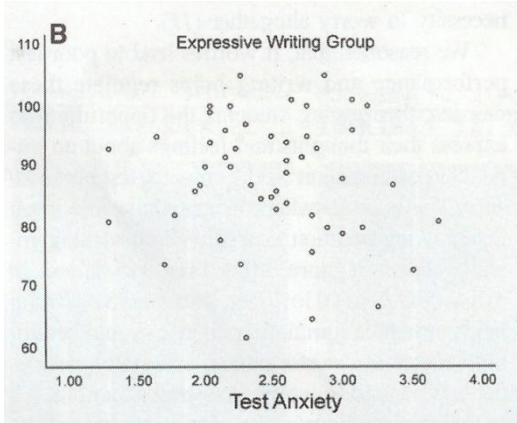


Fig. 3B. Scatterplot of the relation of test anxiety and test scores in the worry writing group.

These data raised the question of whether worry writing helped all students or just those who were test anxious. When the data were separated that way, it became clear that only test anxious students (“chokers”) benefitted from the worry. No such effect appeared in students with low test anxiety (data not shown here). See Fig. 4.

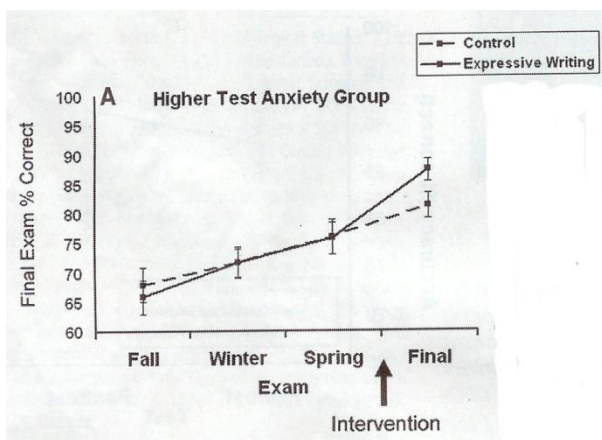


Fig. 4A. Average final exam scores in high-anxiety students at end-of-term exams, when there was no worry writing, and at the year-end final, when half of the students did worry writing.

Discussion

In both laboratory and classroom environments, the data indicated that a single 10-min pre-test worry writing opportunity reduced the interference on high-stakes testing that could occur in test-anxious students.